

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

Well Operator's Report of Well Work

Farm name: Joe Powell Operator Well No.: # 1
LOCATION: Elevation: 1100 ft Quadrangle: M. Flintstone
District: Sherman County: Calhoun
Latitude: 11800 Feet South of 38 Deg. 50 Min. 00 Sec.
Longitude 5050 Feet West of 81 Deg. 02 Min. 30 Sec.

Company: Greer, Inc.

	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Address: <u>4787 Sassafras Ridge Rd</u>				
<u>Arnoldsburg, WV 25234</u>				
Agent: <u>Elma Jean Mace</u>	<u>9 5/8"</u>	<u>300'</u>	<u>300'</u>	<u>CTS</u>
Inspector: <u>Ed Garner</u>				
Date Permit Issued: <u>7-22-2008</u>	<u>7"</u>	<u>2240</u>	<u>2240</u>	<u>300</u>
Date Well Work Commenced: <u>7-30-2008</u>				
Date Well Work Completed: <u>3-1-2009</u>	<u>4 1/2"</u>	<u>0</u>	<u>5512</u>	<u>500</u>
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig				
Total Depth (feet): <u>5512 ft</u>				
Fresh Water Depth (ft.): <u>50 ft</u>				
Salt Water Depth (ft.): <u>1200 ft</u>				
Is coal being mined in area (N/Y)? <u>No</u>				
Coal Depths (ft.): <u>0</u>				

OPEN FLOW DATA

Producing formation Marcellus Pay zone depth (ft) 5500 ft
Gas: Initial open flow 0 MCF/d Oil: Initial open flow 0 Bbl/d
Final open flow 6.5 MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests 8 Hours
Static rock Pressure 250 psig (surface pressure) after 48 Hours

Second producing formation none Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Signed: GREER INC
By: Elma Mace
Date: 3-21-13

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200 MACE
2 MCF MACE
No physical change

Stump/Garrett #3 API number 0130-4683

Perforation were done at the following depths with 200 mmcf Nitrogen. No Physical Changes occurred.

Depths:	Formation:
3437	Sand
3675	Slate & Shale
3774	Slate & Shale
3807	Slate & Shale
4049	Slate & Shale
4092	Slate & Shale
4138	Slate & Shale
4152	Slate & Shale
4425	Slate & Shale
4549	Slate & Shale
4688	Slate & Shale
4881	Slate & Shale
4918	Slate & Shale
4962	Slate & Shale
5072	Slate & Shale
5080	Slate & Shale
5112	Slate & Shale
5162	Slate & Shale
5209	Slate & Shale
5348	Marcellus

DATE: October 30, 2006
API # 047 - 015 - 02709

Well Operator's Report of Well Work

Longitude 11595 Feet West of 80 Deg. 52 Min 30 Sec.

Coal Depths (ft.): _____

[illegible]

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Date: 4/11/13

15- 02709

Completion Data

	Stage 1		Stage 2		Stage 3	
Date	7/28/2005		7/28/2005		8/3/2005	
	75Q N2		75Q N2		75Q N2	
Frac	Foam		Foam		Foam	
Formation(s)	Dev Sand		Big Lime		Big Lime	
Interval	3065-3409		1950-2007		2048-2105	
# of Perf	20		20		18	
BD Press	2014	psi	3050	psi	?	psi
Avg Treating Press	1624	psi	2500	psi	2650	psi
Max Treating Press	1725	psi	3200	psi	2898	psi
		bp		bp		bp
Avg Rate (dh)	32.3	m	30	m	27	m
ISIP	1250	psi	1900	psi	1650	psi
5 min SIP		psi		psi		psi
Total Acid	500	gal	756	gal	935	gal
Total N2	323	scf	158	scf	158	scf
Total H2O	202	bbl	199	bbl	168	bbl
Total Sand	499	sx	253	sx	217	sx

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15-02709

Geologic Data

Lithology	Color	Top	Bottom	Thickness
SANDY SHALE	BROWN	0	5	5
CLAY		5	11	6
SANDSTONE		11	130	119
COAL		130	135	5
SANDY SHALE		135	160	25
COAL		160	168	8
SANDSTONE		168	205	37
SANDY SHALE		205	300	95
SANDSTONE		300	370	70
SANDY SHALE		370	411	41
SANDSTONE		411	571	160
SANDY SHALE		571	850	279
COAL		850	880	30
SANDY SHALE		880	1120	240
COAL		1120	1136	16
SANDSTONE		1136	1214	78
SANDY SHALE		1214	1298	84
COAL		1298	1301	3
SANDY SHALE		1301	1393	92
SANDSTONE		1393	1461	68
SANDY SHALE		1461	1602	141
SANDSTONE		1602	1668	66
SANDY SHALE		1668	1682	14
SHALE		1682	1700	18
SANDY SHALE		1700	1775	75
SANDSTONE		1775	1805	30
SANDSTONE		1805	1815	10
SANDY SHALE		1815	1869	54
LIMESTONE		1869	1895	26
SANDY SHALE		1895	1906	11
LIMESTONE		1906	1917	11
SHALE		1917	1955	38
LIMESTONE		1955	2160	205
SHALE & SANDY SHALE		2160	2210	50
SANDY SHALE		2210	2429	219
SHALE		2429	2912	483
SANDY SHALE		2912	3200	288
SHALE		3200	3266	66
SANDSTONE		3266	3390	124
SANDY SHALE		3390		

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State of West Virginia
Department of Environmental Protection
Office of Oil and Gas
Well Operator's Report of Well Work

DATE: 3/28/2013
API #: 47-5101391

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Farm name: Starovic Unit

Operator Well No.: 2H

LOCATION: Elevation: 1170.07"

Quadrangle: Cameron

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District: Cameron

County: Marshall

Latitude: 39 Feet South of 49 Deg. 58 Min. 64.41 Sec.

Longitude: 80 Feet West of 35 Deg. 02 Min. 35.12 Sec.

Company: Chief Oil & Gas LLC

Address: <u>6051 Wallace Road Ext. Ste 300</u>	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
<u>Wexford PA 15090</u>	<u>24"</u>		<u>80'</u>	
Agent: <u>Sam Fragale</u>	<u>20"</u>		<u>395'</u>	<u>393.45</u>
Inspector: <u>Derrick Haught</u>	<u>13.375"</u>		<u>1182'</u>	<u>1161</u>
Date Permit Issued: <u>9/29/2010</u>	<u>9.625"</u>		<u>2368'</u>	<u>945</u>
Date Well Work Commenced: <u>10/29/2010</u>	<u>5.5"</u>		<u>10415'</u>	<u>994</u>
Date Well Work Completed: <u>12/7/2010</u>				
Verbal Plugging: <u>N/A</u>				
Date Permission granted on: <u>N/A</u>				
Rotary <input type="checkbox"/> Cable <input type="checkbox"/> Rig <input checked="" type="checkbox"/>				
Total Vertical Depth (ft): <u>6836.6'</u>				
Total Measured Depth (ft): <u>10427'</u>				
Fresh Water Depth (ft.): <u>350'</u>				
Salt Water Depth (ft.): <u>2122'</u>				
Is coal being mined in area (N/Y)? <u>N</u>				
Coal Depths (ft.): <u>457', 786', 841', 858'</u>				
Void(s) encountered (N/Y) Depth(s) <u>N</u>				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 7429'

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.


Signature

3/28/13
Date

Were core samples taken? Yes _____ No ☒Were cuttings caught during drilling? Yes _____ No ☒Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list n/a

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

7702' - 8056', 8121' - 8475', 8540' - 8894', 9413' - 9847', 9965' - 10021'

APR 08 2013
 E.M. [illegible]
 SECTION

Plug Back Details Including Plug Type and Depth(s):

Formations Encountered:	Top Depth	/	Bottom Depth
Surface:			
Dirt & Rock	0'	/	80'
Sand & Shale	80'	/	310'
Shale	310'	/	670'
Sand & Shale	670'	/	1210'
Shale	1210'	/	1337'
Sand & Shale	1337'	/	2430'
Shale	2430'	/	2650'
Sand & Shale	2650'	/	2890'
Sandstone	2890'	/	3400'
Shale	3400'	/	4718'
Sand & Shale	4718'	/	5365'
Silt/ Shale	5365'	/	6130'
Sand & Shale	6130'	/	6512'
Marcellus	6512'	/	10427'

State of West Virginia
Department of Environmental Protection
Office of Oil and Gas

Well Operator's Report of Well Work

Farm Name: MAVAN, LLC et al Operator Well No. Deitz 3

LOCATION: Elevation: 1893' Quadrangle: Lockwood

District: Jefferson County: Nicholas

Latitude: 6500' Feet South of 38 Deg. 20 Min. 00 Sec.

Longitude: 4275' Feet West of 81 Deg. 05 Min. 00 Sec.

Company: Range Res-Pine Mountain Inc.

Address: P.O. Box 2136

Abingdon, Virginia 24212

Agent: Tom Young

Inspector: Terry Urban

Date Permit Issued: 6/6/2007

Date Well Work Commenced: 9/7/2007

Date Well Work Completed: 11/2/2007

Verbal Plugging: _____

Date Permission granted on: _____

Rotary	X	Cable	Rig
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Total Depth (feet): 2705'

Fresh Water Depth (ft.): 170'

Salt Water Depth (ft.): _____

Is coal being mined in area (N/Y)? N

Coal Depths (ft.): N/A

[illegible]

OPEN FLOW DATA

Producing Formation:	Big Lime/Blue Monday	Pay zone depth	2518-2574	(ft)
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Gas: Initial open flow:	MCF/d	Oil: Initial open flow:	Bbl/d
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Final open flow: 822 MCF/d Final open flow: Bbl/d

Time of open flow between initial and final tests	4	Hours
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Static Rock Pressure	1220	Psig (surface pressure) after	24	Hours
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Second Producing Formation:	Pay zone depth	(ft)
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Gas: Initial open flow:	MCF/d	Oil: Initial open flow:	Bbl/d
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Final open flow: MCF/d Final open flow: Bbl/d

Time of open flow between initial and final tests Hours

Static Rock Pressure	Psig (surface pressure) after	Hours
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Signed: Range Resources - Pine Mountain Inc.
By: [Signature]
Date: 4/11/13

Completion Information

Well Deitz 3
 Permit 47-067-00894

	Stage 1	Stage 2	Stage 3
Date	10/12/2007	11/2/2007	11/02/2007
Frac Formation(s)	75Q N2 Foam Big Lime	75Q N2 Foam Big Lime	75Q N2 Foam Blue Monday
Interval # of Perf	2696-2724	2568-2574.5 15+15	2510-2524 13
BD Press	500 psi	400 psi	1863 psi
Avg Treating Press	2700 psi	2940 psi	2777 psi
Max Treating Press	4000 psi	3200 psi	2870 psi
Avg Rate (dh)	21 bpm	22.4 bpm	19 bpm
ISIP	4000 psi	1967 psi	2563 psi
2 min SIP	psi	1670 psi	2200 psi
Total Acid	500 gal	800 gal	gal
Total N2	240,000 scf	382,000 scf	324,000 scf
Total H2O	268 bbl	bbl	bbl
Total Sand	175 sx	418 sx	595 sx

Geologic Information

Formation	Top (ft)*	Bottom (ft)*
Sand and Shale	0	1456
Salt Sand	1456	1655
Sand and Shale	1655	2155
Middle Maxon	2155	2205
Shale and Sand	2205	2455
Little Lime	2455	2528
Pencil Cave Shale	2528	2550
Big Lime	2550	2716
TD	2716	

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State of West Virginia
Division of Environmental Protection
Section of Oil and Gas

Well Operator's Report of Well Work

Farm name: BETTY RUSMISELL Operator Well No.: 626776LOCATION: Elevation: 1459' Quadrangle: ADRIAN 7 1/2District: BUCKHANNON County: UPSHUR
Latitude: 5700 Feet South of 39 Deg. 00 Min. 00 Sec.
Longitude 9450 Feet West of 80 Deg. 15 Min. 00 Sec.Company: CHESAPEAKE APPALACHIA, L.L.C.

	Casing & Tubing	Used in Drilling	Left in well	Cement fill up Cu. Ft.
Address: Post Office Box 6070				
Charleston, WV 25362-0070	20"	46'	46'	DRIVEN
Agent: Michael John	11 3/4"	165'	165'	CTS
Inspector: Bill Hatfield	8 5/8"	1722'	1722'	CTS
Date Permit Issued: 03/13/2008	4 1/2"	7655'	7655'	292
Date Well Work Commenced: 04/11/2008				
Date Well Work Completed: 06/04/2008				
Verbal Plugging:				
Date Permission granted on:				
Rotary XX Cable Rig				
Total Depth (feet): LTD: 7659'; DTD: 7655'				
Fresh Water depths (ft): 46', 170'				
Salt water depths (ft): 1722'				
Is coal being mined in area (Y/N)? No				
Coal Depths (ft): 165'-170'				

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OPEN FLOW DATA

Producing formation Marcellus Pay zone depth (ft) 7392-7344

X Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow 1,000 MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests 4 Hours

Static rock Pressure 1500 psig (surface pressure) after 72 Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

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Signed: Marc Watkins, Chesapeake Appalachia, L.L.C.
By: Marc Watkins, District Manager

Date: 11/4/08

FORMATION RECORD: Well
0 to from Driller's Log Book, to TD from Gamma Ray Log

WATER:	<u>Depth (ft)</u>	<u>Amount</u>	<u>Type</u>
	46'	Damp	Fresh
	170'	Damp	Fresh

OIL SHOWS:	Depth	Amount

STIMULATION:
Stage 1:
Marcellus:
 Frac w/ 12,796 bbls of Slickwater, 240,000# 40/70 & 270,000#
 100 Mesh, BD: 3200 psi, ATR=70 bpm, ATP=6200 psi, ISIP:
 3083 psi, 5 min: 2233 psi

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas
Well Operator's Report of Well Work

Farm Name: Delmar Light 1HOperator Well No.: 831090LOCATION Elevation: 1745'
District: BuckhanQuadrangle: Adrian
County: Upshur

Latitude: 4600ft South of 39° 00' 00"
Longitude: 12650ft West of 80° 15' 00"

Company: Chesapeake Appalachia, L.L.C.
P.O. Box 18496
OKC, OK 73154-0496

Agent: Eric Gillespie

Inspector: Bill Hatfield

Date Permit Issued: 06/25/2009

Date Well work commenced: 04/16/2010

Date Well Work completed: 6/28/2010

Verbal Plugging Permission

Granted on / /

Rotary ☒ Cable ☐ Rig

Total Depth (ft): 13065' TVD (ft): 7552'

Fresh Water Depth (ft): 62' & 275'

Salt Water Depth (ft.): NA

Is coal being mined in area (Yes ☐ No ☒)

Coal Depths (ft): 270' & 275'

Was this well logged and plugged back?

Yes ☐ No ☒ if yes—

depth cement plug set _____

Casing & Tubing	Used in Drilling	Left in Well	Cement Fill-Up Cu.Ft.
20"	40'	40'	Driven
13 3/8"	475'	475'	609 CF
9 5/8"	1727'	1727'	714 CF
5 1/2"	13065'	13065'	1919 CF

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Open Flow Data

1st Producing Formation

Pay Zone Depth 7,801 ft to 12,923 ft

Gas: Initial Open Flow 802 Mcf/day Oil: Initial Open Flow bbl/day
Final Open Flow Mcf/day Final Open Flow bbl/day

Time of Open Flow between Initial and Final Tests In Line hours

Static Rock Pressure 3,398 psig after hours

2nd Producing Formation

Pay Zone Depth ft to ft

Gas: Initial Open Flow Mcf/day Oil: Initial Open Flow bbl/day
Final Open Flow Mcf/day Final Open Flow bbl/day

Time of Open Flow between Initial and Final Tests hours

Static Rock Pressure psig after hours

3rd Producing Formation

Pay Zone Depth ft to ft

Gas: Initial Open Flow Mcf/day Oil: Initial Open Flow bbl/day
Final Open Flow Mcf/day Final Open Flow bbl/day

Time of Open Flow between Initial and Final Tests hours

Static Rock Pressure psig after hours

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Chesapeake Energy
Well No.: 831090

Perforated Intervals

1 st Stage	Marcellus	10	Holes from	12,601 ft to 12,923
2 nd Stage	Marcellus	10	Holes from	12,201 ft to 12,523
3 rd Stage	Marcellus	10	Holes from	11,801 ft to 12,123
4 th Stage	Marcellus	10	Holes from	11,401 ft to 11,723
5 th Stage	Marcellus	10	Holes from	11,001 ft to 11,323
6 th Stage	Marcellus	10	Holes from	10,601 ft to 10,923
7 th Stage	Marcellus	10	Holes from	10,201 ft to 10,523
8 th Stage	Marcellus	10	Holes from	9,801 ft to 10,123
9 th Stage	Marcellus	10	Holes from	9,401 ft to 9,723
10 th Stage	Marcellus	10	Holes from	9,003 ft to 9,330
11 th Stage	Marcellus	10	Holes from	8,601 ft to 8,923
12 th Stage	Marcellus	10	Holes from	8,201 ft to 8,523
13 th Stage	Marcellus	10	Holes from	7,801 ft to 8,123

Fracturing / Stimulation

1 st Stage	Type of Treatment Slickwater			
	Total Acid 5,000 Gal of 15% HCl		Breakdown Pressure 7,170 psi	
	Average Rate 66.3 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 7,026 psi MTP 9,199 psi	
	Total Fluid 9,105 bbl	Total Nitrogen 0 scf	Total Sand 119,663 lb of 100 mesh	
			Total Sand 261,243 lb of 40/70	
	ISIP 4,450 psi	5 min 3,738psi		
2 nd Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,036 psi	
	Average Rate 86.5 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 7,716 psi MTP 8,362 psi	
	Total Fluid 9,019 bbl	Total Nitrogen 0 scf	Total Sand 122,742 lb of 100 mesh	
			Total Sand 270,112 lb of 40/70	
	ISIP 4,663 psi	5 min 3,917 psi		
3 rd Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 8,205 psi	
	Average Rate 83.4 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 7,692 psi MTP 8,480 psi	
	Total Fluid 11,567 bbl	Total Nitrogen 0 scf	Total Sand 122,085 lb of 100 mesh	
			Total Sand 285,621 lb of 40/70	
	ISIP 4,443 psi	5 min 3,745 psi		
4 th Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,954 psi	
	Average Rate --- scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP --- psi MTP --- psi	
	Total Fluid 10,474 bbl	Total Nitrogen 0 scf	Total Sand 124,340 lb of 100 mesh	
			Total Sand 285,452 lb of 40/70	
	ISIP 4,530 psi	5 min 3,927 psi		
5 th Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,781 psi	
	Average Rate 85.3 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 8,090 psi MTP 8,582 psi	
	Total Fluid 14,769 bbl	Total Nitrogen 0 scf	Total Sand 120,622 lb of 100 mesh	
			Total Sand 268,619 lb of 40/70	
	ISIP 5,183 psi	5 min 4,270 psi		
6 th Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,437 psi	
	Average Rate 87 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 7,801 psi MTP 8,544 psi	
	Total Fluid 10,423 bbl	Total Nitrogen 0 scf	Total Sand 124,901 lb of 100 mesh	
			Total Sand 295,293 lb of 40/70	
	ISIP 4,661 psi	5 min 4,093 psi		
7 th Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,904 psi	
	Average Rate 86 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>		ATP 7,693 psi MTP 8,584 psi	
	Total Fluid 11,523 bbl	Total Nitrogen 0 scf	Total Sand 119,598 lb of 100 mesh	
			Total Sand 294,305 lb of 40/70	
	ISIP 4,625 psi	5 min 4,000 psi		
8 th Stage	Type of Treatment Slickwater			
	Total Acid 2,500 Gal of 15% HCl		Breakdown Pressure 7,904 psi	

97-03665

	Average Rate 91 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,723 psi	MTP 8,499 psi
	Total Fluid 10,573 bbl	Total Nitrogen 0 scf	Total Sand 122,234 lb of 100 mesh
			Total Sand 285,531 lb of 40/70
	ISIP 4,554 psi	5 min 3,850 psi	
9 th Stage	Type of Treatment Slickwater		
	Total Acid 2,500 Gal of 15% HCl	Breakdown Pressure 7,322 psi	
	Average Rate 87 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,440 psi	MTP 7,988 psi
	Total Fluid 9,414 bbl	Total Nitrogen 0 scf	Total Sand 119,714 lb of 100 mesh
			Total Sand 282,948 lb of 40/70
	ISIP 4,668 psi	5 min 4,080 psi	
10 th Stage	Type of Treatment Slickwater		
	Total Acid 2,500 Gal of 15% HCl	Breakdown Pressure 8,217 psi	
	Average Rate 87 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,382 psi	MTP 7,870 psi
	Total Fluid 11,253 bbl	Total Nitrogen 0 scf	Total Sand 124,000 lb of 100 mesh
			Total Sand 280,000 lb of 40/70
	ISIP 4,391 psi	5 min 3,845 psi	
11 th Stage	Type of Treatment Slickwater		
	Total Acid 2,500 Gal of 15% HCl	Breakdown Pressure 7,213 psi	
	Average Rate 85 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,148 psi	MTP 7,458 psi
	Total Fluid 9,500 bbl	Total Nitrogen 0 scf	Total Sand 122,000 lb of 100 mesh
			Total Sand 280,000 lb of 40/70
	ISIP 5,252 psi	5 min 4,354 psi	
12 th Stage	Type of Treatment Slickwater		
	Total Acid 2,500 Gal of 15% HCl	Breakdown Pressure 6,864 psi	
	Average Rate 87 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,395 psi	MTP 7,800 psi
	Total Fluid 10,782 bbl	Total Nitrogen 0 scf	Total Sand 128,496 lb of 100 mesh
			Total Sand 280,694 lb of 40/70
	ISIP 4,422 psi	5 min 3,721 psi	
13 th Stage	Type of Treatment Slickwater		
	Total Acid 2,500 Gal of 15% HCl	Breakdown Pressure 6,695 psi	
	Average Rate 87 scf/min <input type="checkbox"/> or bpm <input checked="" type="checkbox"/>	ATP 7,258 psi	MTP 8,115 psi
	Total Fluid 10,353 bbl	Total Nitrogen 0 scf	Total Sand 146,318 lb of 100 mesh
			Total Sand 230,026 lb of 40/70
	ISIP 4,082 psi	5 min 3,560 psi	

Well Log

Formation Name	Top	Bottom	Comments
MAXTON	1367	1439	
LITTLE LIME	1613	1677	
BIG LIME	1677	1864	
BIG INJUN	1864	1887	
GANTZ	1931	1996	
GORDON	2013	2034	
4 TH SAND	2369	2384	
5 TH SAND	2419	2485	
BAYARD	2525	2533	
ELIZABETH	3667	2686	
WARREN	2782	2843	
BEDFORD	3562	3572	
SPEECHLEY	3124	3137	
BALLTOWN	3305	3370	
RILEY	3936	3945	
BENSON	4323	4366	
BLK	5781	5812	
SYCAMORE	6595	6609	
MIDDLESEX	6977	7296	
GENESEO	7296	7330	
TULLY	7330	7362	
HAMILTON	7362	7461	
UPPER MARCELLUS	7461	7513	
PURCELL	7513	7515	
LOWER MARCELLUS	7515	7574	

Signed: 
CHESAPEAKE APPALACHIA, LLC

97-03665

By: _____
Date: Nov 16 2010